VOLUNTEER MUSKELLUNGE SPAWNING SURVEY

Background - Muskellunge spawning habitat needs to be identified and protected from future disturbances. Spawning areas with suitable sediments, woody cover, and deadfall trees are needed for naturally self-sustained muskellunge populations to continue to thrive. In many lakes, the location of these critical spawning areas has not been documented. Identification of these areas will facilitate their protection. This is especially important on category 1 and 2 musky lakes (see Wisconsin Muskellunge Waters, Publication FH-515, WDNR).

Spawning sites are generally located in shallow shoreline areas, less than 3 feet in depth, within aquatic vegetation (such as bulrushes) or on sediments covered with leafy debris or woody particles; they may be near inlet streams. Spawning sites are about 150 feet in length but can range from 30 to over 10,000 feet.

Spawning Locations - Muskellunge spawning sites should be located using the visual observation method described by Zorn et al. (1998) and Rust et al. (2002). Optimum spawning temperature is about 55 F, but spawning may occur at temperatures from 49 to 60 F. One researcher noted that muskellunge movement increases greatly in early spring before temperatures begin to rise, suggesting that factors other than just temperature may influence the onset of spawning. Observations should be conducted from mid-April to mid-May at water temperatures from 50 to 55^{o}F. Surveys should be done at night, starting at sunset (after 7 p.m.) and continuing until no later than 2 a.m. Clear, calm nights are the best. One or more nights may be spent to complete a survey of the lake's entire shoreline, as long as the surveys are completed within the specified range of temperatures. On larger lakes, more nights or more crews may be needed to sample the entire shoreline. A boat equipped with a bow-mount electric trolling motor should be used to cover the shallow area of the lake shoreline slowly and quietly in about 3 feet of water. Do not use outboard motors in the shallows. Two spotlights (one million candle power) should be used to scan the shoreline area and locate muskellunge. Approximate locations where individuals or pairs of muskellunge are observed should be marked on a copy of a lake map (using a sequential numbering system - the first fish (or pair) seen is #1, the second fish, #2, etc.) and latitude and longitude should be

recorded from a GPS unit. Record the lat/long for each muskellunge (or pair) observed on the SPAWNING LOCATION SURVEY data sheet. More than 2 fish may be recorded for the same location if they are close to each other. You do not need to be on top of the fish to get a lat/long; try to minimize disturbance of the fish. Because we are mainly trying to document the segments of the shoreline that are used by muskellunge for spawning, a lat/long offshore from the fish is fine. These fish may be very approachable during this period of time. However, please resist the temptation to approach them. Multiple surveys can help confirm spawning areas, identify larger "spawning grounds", and will allow measurement of within-lake variability of the methods.

Preliminary studies found that the number of muskellunge counted in spotlight surveys make up between 80 and 90% of the estimated population. More studies are needed to test this relationship. When possible, conduct spotlighting surveys on lakes where recent population estimates are available or planned. Work with the local Fisheries Biologist to find out which lakes are planned for population estimates. Also, a courtesy call to the local Conservation Warden will help alleviate potential concerns from lakeshore residents.

Equipment Needed:

_____ Boat (an electric trolling motor, depth finder, and elevated deck will make things easier)
_____ Global Positioning System
_____ Thermometer
_____ 2 spotlights (1 million candle power) and spare 12 volt batteries
_____ Lake map(s)
_____ SPAWNING LOCATION SURVEY data sheets
_____ pencils, clipboard
_____ Life jackets
_____ Warm clothes

References:

Rust et al. 2002. Lake characteristics influencing spawning success of muskellunge in northern Wisconsin lakes. North American Journal of Fisheries Management 22:834-841.

Zorn et al. 1998. The influence of spawning habitat on natural reproduction of muskellunge in Wisconsin. North American Journal of Fisheries Management 127:995-1005.

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Department of Natural Resources COOPERATIVE SPAWNING LOCATION SURVEY

Lake_____ County_____ Date ___ / ___ / _____

Observers_____Club_____

Target Fish _____ Water Temperature_____ F Water Clarity _____ feet

Time - Start ____ : ____ End ____ : ____ Weather Conditions_____

Map #	Latitude	Longitude	Number of fish Observed	Location Description
	N	W		
	N	W		
	N	W		
	N	W		
	N	W		
	N	W		
	N	W		
	N	W		
	N	W		
	N	W		
	N	W		
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	N	W		
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	N	W		
	N	W		

Attach Lake Map to this sheet